In the Specification:

Please delete paragraph [0004] and replace it with the following:

[0004] Any electrically neutral substance, including electrical conductors have equal amounts of positive and negative charges and, in general, a conductor's properties can depend on the physical state of both kinds of charges. All good conductors can be considered with in few classes considered below from the viewpoint of the crystallinity of their charges. For example, solid metals fall to the class of partially crystalline conductors, because their positive ions form crystalline lattice and their negative charges are in a disordered state which can be described as a stable free electron gas.

Please delete paragraph [0009] and replace it with the following:

[0009] The creation of metallic nanowires having diameters less than 100 nm was described in U.S. Pat. No. 4,325,795 (1982) by R. Bourgoin. In accordance with this teaching, nanowires having some properties similar to SC at ambient temperatures should be prepared within a liquid dielectric polymer medium, namely epoxy resin, with the use of a very fine powder of conventional metal, namely bismuth, constituting not less than 10 vol. % in this mixture. The organic polymer medium does not contribute any charges participating in the formation of nanowires. The patent does not describe how only the decrease of the diameter of the bismuth wire results in superconductivity at ambient ~~temperaturesw~~ temperatures. Bulk bismuth is well known to have $T_c = 5$ K, and even substantial reduction of its size (for instance, in very thin films) increases T_c up to only about 8 K. Nonetheless, direct participation of large amounts of conventional metals to conductivity places this metal-organic composite material in the same conducting class as pure metals.

Please delete paragraph [0012] and replace it with the following:

[0012] In general, superconductivity is a highly complicated physical phenomenon. Since first discovery, it took half-century to develop BCS theory explaining metallic SC (J. Bardeen, L. Cooper, J. Schrieffer, *Phys.Rev.* V. 108, p. 1175 (1957)). According to the BCS theory, superconductivity may occur only from electron pairing mediated by a mechanism of energetic exchange within an electron couple, becoming a new

particle which doesn't obey Fermi-statistics. For instance, in metals and ceramics, delocalized superconducting pairs have charge $-2e$ and spin S=0, and are condensed on the same energetic level. As a result of our invention, BCS theory exploiting only electron-phonon pairing mechanisms is not universal, and fails to ~~descdribe~~ describe so-called "high temperature SC" in new ceramics, as well as some other related effects. For instance, on the basis of BCS, it was always thought that any SC phenomenon is incompatible with ferromagnetism. Nonetheless, the first inorganic materials combining SC with ferromagnetism at about liquid helium temperatures were discovered recently by American scientists and others (see, for instance S.S. Saxena et al., *Nature*, v. 406, p. 587 (2000); C. Pfleiderer et al., *Nature*, v. 412, p. 58 (2001); D. Aoki et al., *Nature*, v. 413, p. 613 (2001)). This discovery demonstrates that mechanisms other than BCS mechanisms may also exist, and some conventional definitions of SC, including those based on the BSC Meisner effect, may not be widely applicable.

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